



Emergency

Medical

Dispatching:

Rapid
Identification
and Treatment
of Acute
Myocardial
Infarction

EMERGENCY MEDICAL DISPATCHING:

Rapid
Identification
and Treatment
of Acute
Myocardial
Infarction



National Heart Attack
Alert Program (NHAAP)



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Coronary heart disease (CHD) continues to be the leading cause of death in the United States despite a remarkable decline in CHD mortality over the last 30 years. The National Heart, Lung, and Blood Institute estimates that as many as 1.25 million people will experience an acute myocardial infarction (AMI) in 1993, and nearly 500,000 will die.

The importance of early treatment has been underscored in the last decade with the results from clinical trials of thrombolytic therapy demonstrating mortality reductions with earlier treatment. Out-of-hospital sudden cardiac death is an ever-present threat, further highlighting the importance of early recognition and treatment.

However, a fundamental barrier to timely treatment is delay—at the level of the patient, the emergency medical services (EMS) system, and the emergency department. In June 1991, the National Heart, Lung, and Blood Institute launched the National Heart Attack Alert Program (NHAAP) with the goal of reducing AMI morbidity and mortality, including sudden cardiac death. The NHAAP Coordinating Committee was formed to help develop, implement, and evaluate the program. This committee is composed of representatives of 39 national scientific, professional, governmental, and voluntary organizations interested in lowering AMI morbidity and mortality through professional, patient, and public education.

The importance of the EMS system for cardiac care has been highlighted in the American Heart Association's recent guidelines for cardiopulmonary resuscitation and emergency cardiac care where early access to EMS is identified as the first link in the chain of survival for cardiac arrest. The chain of survival concept has been expanded to include patients with symptoms and signs of AMI.

Emergency medical dispatching has been recognized as a vital part of the early access link in the chain of survival for cardiac arrest. The potential important role for emergency medical dispatchers (EMD's) in the prehospital care of patients with symptoms and signs of an AMI, as well as patients with cardiac arrest, is the underlying assumption of this paper.

Thus, while emergency medical dispatching is a broader topic than AMI and cardiac arrest, this paper represents a consensus of its potential contribution to the seamless prehospital identification and treatment of patients with AMI, including cardiac arrest, as well as a consensus of the critical issues and recommendations for medical dispatch protocols, processes, training and certification, and quality control and improvement.

Nevertheless, it should be noted that there is a paucity of research related to outcomes associated with emergency medical dispatching. Only through evaluation research can the optimal EMD processes and protocols, associated with specified outcomes, be elucidated.

Claude Lenfant, M.D.
Director
National Heart, Lung, and
Blood Institute

Lead Writer

Jeffrey J. Clawson, M.D.
President
National Academy of Emergency
Medical Dispatch
Salt Lake City, Utah

**MEMBERS OF
THE WRITING
GROUP****Contributors**

James M. Atkins, M.D.
Medical Director, Dallas Emergency
Medical Services
Professor of Medicine
Department of Internal Medicine
University of Texas Southwestern
Medical Center at Dallas
Dallas, Texas

Charles K. Francis, M.D.
Professor of Clinical Medicine
Columbia University College of
Physicians and Surgeons
Director
Department of Medicine
Harlem Hospital Center
New York, New York

Charles Glass
Highway Safety Specialist
Office of Enforcement and Emergency
Medical Services
National Highway Traffic Safety
Administration
Department of Transportation
Washington, D.C.

Fred Hurtado, B.A., EMT-P
Member, College of Fellows
National Academy of Emergency
Medical Dispatch
Salt Lake City, Utah

Susan Ryan, M.Sc.
Chief
Emergency Medical Services Division
National Highway Traffic Safety
Administration
Department of Transportation
Washington, D.C.

Jane Scott, Sc.D., M.S.N.
Health Scientist Administrator
Center for Medical Effectiveness
Research
Agency for Health Care Policy and
Research
Rockville, Maryland

Staff

John C. Bradley, M.S.
National Heart Attack Alert Program
Support Contract Manager
NHLBI Education Programs Support
Contract
R.O.W. Sciences, Inc.
Rockville, Maryland

Mary McDonald Hand, M.S.P.H., R.N.
Coordinator
National Heart Attack Alert Program
Office of Prevention, Education, and
Control
National Heart, Lung, and Blood
Institute
National Institutes of Health
Bethesda, Maryland

Michael Horan, M.D., Sc.M.
Director
Division of Heart and Vascular
Diseases
National Heart, Lung, and Blood
Institute
National Institutes of Health
Bethesda, Maryland

Acknowledgments

Jeffrey Grunow, R.N., EMT-P
Assistant Professor of Emergency
Medical Care Studies
Eastern Kentucky University
Richmond, Kentucky

Carl C. Van Cott
Assistant Chief, Engineering
Office of Emergency Medical Services
North Carolina Department of Human
Resources
Raleigh, North Carolina

Agency for Health Care Policy and Research
American Academy of Family Physicians
American Academy of Insurance Medicine
American Association of Critical Care Nurses
American Association of Occupational Health Nurses
American College of Cardiology
American College of Chest Physicians
American College of Emergency Physicians
American College of Occupational and Environmental Medicine
American College of Physicians
American College of Preventive Medicine
American Heart Association
American Hospital Association
American Medical Association
American Nurses' Association, Inc.
American Pharmaceutical Association
American Public Health Association
American Red Cross
Association of Black Cardiologists
Centers for Disease Control and Prevention
Department of Defense, Health Affairs
Department of Veterans Affairs
Emergency Nurses Association
Federal Emergency Management Agency
Food and Drug Administration
Health Care Financing Administration
Health Resources and Services Administration
International Association of Fire Chiefs
National Association of Emergency Medical Technicians
National Association of EMS Physicians
National Association of State Emergency Medical Services Directors
National Black Nurses' Association, Inc.
National Center for Health Statistics
National Heart, Lung, and Blood Institute
National Highway Traffic Safety Administration
National Medical Association
NHLBI Ad Hoc Committee on Minority Populations
Society for Academic Emergency Medicine
Society of General Internal Medicine

**NATIONAL HEART
ATTACK ALERT
PROGRAM
COORDINATING
COMMITTEE
MEMBER
ORGANIZATIONS**

The American Heart Association (AHA) has proposed the concept of a “chain of survival” for victims of cardiac arrest.¹ The chain of survival includes four links, each of which must be robust to ensure maximal survival rates.² The components of the chain are:

1. Early access to the emergency medical services (EMS) system
2. Early cardiopulmonary resuscitation (CPR), either by bystanders or first-responder rescuers
3. Early defibrillation by first responders, emergency medical technicians, or paramedics
4. Early advanced life support.

Although the chain of survival was initially conceptualized for cardiac arrest victims, patients with an acute myocardial infarction (AMI) also benefit from the chain-of-survival approach to emergency cardiac care in the community.³

The first link of the chain of survival (early access) encompasses several major actions that must occur rapidly. Among these are recognition of the symptoms and signs of the AMI by the patient and bystanders, notification of the EMS system (often by use of the 9-1-1 emergency telephone number), recognition of a cardiac emergency by the medical dispatcher, and activation of available EMS responders. Each action is a part of the early access link.²

During the past 15 years, the public has been educated to use the 9-1-1 emergency telephone number to summon help for a range of emergencies, from minor problems to life-threatening conditions.^{3,4} The value of the 9-1-1 system is probably increased if there is a qualified professional—the emergency medical dispatcher (EMD)—to process emergency medical calls.^{2,5}

An EMD is a trained public safety telecommunicator with the additional training and specific emergency medical knowledge essential for the efficient management of processing 9-1-1* calls and other emergency medical communications.⁶ EMD's can perform some important functions that may enhance the efficiency and effectiveness of prehospital care for AMI patients. They can elicit symptoms from callers to determine if a heart attack is possibly occurring^{7,8} and activate appropriate EMS responders to deal with the AMI patient.⁹ Dispatchers can also provide 9-1-1 callers with instructions for how to care for the possible AMI patient until help arrives—including CPR, if necessary.^{7,10-16} Effective emergency medical dispatching has the goal of sending the right EMS resources to the right person, at the right time, in the right way, and providing the right instructions for the care of the patient until help arrives.

This goal can be ideally accomplished through the trained EMD's careful use of a protocol that contains the following elements:^{6,17,18}

1. Systematized caller-interrogation questions that are chief-complaint specific
2. Systematized prearrival instructions

* or a 7-digit emergency access telephone number in those areas without 9-1-1 service.

-
3. Protocols that determine vehicle response mode and configuration based on the EMD's evaluation of injury or illness severity
 4. Referenced information for dispatcher use.

The impact of well-trained, medically managed EMD's on the early care of potential heart attack victims is believed to be potentially beneficial. Five elements seem to be key to an effective emergency medical dispatch program:

- Use of medical dispatch protocols
- Provision of dispatch life support (see definition below)
- EMD training
- EMD certification
- Emergency medical dispatch quality control and improvement processes.

This paper discusses each of these elements and makes some recommendations for improving emergency medical dispatching in the United States. Local, county, and State governments have a responsibility to ensure that 9-1-1 and emergency medical dispatch centers are staffed by qualified EMD's. This involves including emergency medical dispatching as part of a community's assessment of its EMS needs, and designating resources that are indicated, to serve the welfare of its citizens.

Two documents on emergency medical dispatching that have been developed by nationally authoritative agencies are:

- The ASTM's "Standard Practice for Emergency Medical Dispatch"⁶
- The National Association of EMS Physicians' (NAEMSP) position paper, "Emergency Medical Dispatching."¹⁷

The recommendations set forth in these documents are believed to be appropriate, and all EMS systems are encouraged to implement them as much as possible. Rather than repeating or superceding the points made in those documents, this paper addresses emergency medical dispatching issues with an emphasis on care of the AMI patient and reiterates the recommendations that are relevant for an emergency medical dispatching system to effectively handle the AMI patient.

The ASTM is also currently developing two additional documents on emergency medical dispatching. It is anticipated that these standards will parallel many of the recommendations contained in this paper. These documents are:

- The ASTM F-1552 "Standard Practice for Training, Instructor Qualification and Certification Eligibility of Emergency Medical Dispatchers"¹⁹
- The ASTM F-1560 "Standard Practice for Emergency Medical Dispatch Management."²⁰

It should be noted that few well-constructed, objective, published studies exist that address the components or the effectiveness of components of emergency medical dispatching. This is in large part due to the difficulty in defining, as well as determining, those patient outcomes or improvements in patient conditions that are a result of emergency medical dispatching. The patient's condition can deteriorate during the time it takes a prehospital provider to arrive at the scene. Outcome parameters based on the EMS personnel's initial patient findings are not well defined for most prehospital problems other than cardiac arrest and critical trauma. To guarantee that outcomes actually result from the use of a given protocol, a study must demonstrate high compliance to that protocol by the dispatchers. Studies must clearly identify the exact protocol or specific part of the protocol that is undergoing evaluation. The need for further studies regarding the training and retraining, quality control and improvement of EMD's, and the benefit and optimum configuration of prehospital EMD protocols is a general recommendation of this paper.

Medical Dispatch Protocols

Effective EMD practice is based on the consistent use of medically approved dispatch protocols. These protocols are a written system of procedures for the evaluation of, response to, and provision of care to emergency patients.¹³ A written dispatch protocol system directs the EMD to complete a chief-complaint-specific, preplanned interrogation of the 9-1-1 caller to accurately assess and act on the medical emergency.⁶ A dispatch protocol requires the EMD to interrogate the caller to identify the demographics, characteristics, and general medical

problem of the patient and to determine the status of consciousness and breathing. This is followed, when appropriate, by a more specific systematized interrogation related to the reported general medical problem, selected by the EMD from among protocol choices that cover all possible presenting medical emergencies. Systematized interrogation is an essential component of a comprehensive medical dispatch protocol, even for those systems not prioritizing between advanced life support (ALS) and basic life support (BLS) calls.⁵

The dispatcher interrogation process has four important purposes:

1. Provide the EMD with the information needed to make a correct decision regarding initial unit response, including type of EMS personnel required and use of lights and siren
2. Enable the EMD to determine the presence of conditions or situations requiring prearrival instructions
3. Enable the EMD to provide responders with prearrival information for planning of, and preparation for, on-scene patient care activities
4. Assist in ensuring the safety of the patient, the responders, the caller, and other bystanders.

Use of a medical dispatch protocol helps the EMD to avoid making a faulty “diagnosis” of the medical emergency and incorrect dispatching decisions. When EMD’s fail to use medical dispatch protocols, they may be prone to make an assessment of the situation based on inadequate information. The EMD may fail to identify the patient’s chief complaint and, therefore, may provide inadequate response or advice. EMS literature provides many examples of the adverse outcomes and legal problems arising from such faulty dispatch practices.^{21,22}

The issue of patient and bystander denial of or inability to recognize heart attack symptoms is commonly encountered at dispatch.¹³

Medical dispatch protocols should include standardized response classifications based on the EMD’s structured assessment of the medical urgency of the incident and indicate the level of EMS response needed. These response classifications should be based on recognized medical symptoms and the type of incident.^{9,23-25} In systems that vary levels of response, dispatch protocols should specify which situations require an ALS versus a BLS response. This is important in those EMS systems that are “tiered” and allow rapid response by a level of EMS personnel appropriate for the seriousness of the emergency as determined by the EMD (e.g., ALS personnel are dispatched for life-threatening emergencies). Medical dispatch protocols may also specify which situations require a lights-and-siren response to the scene and which do not. With EMS vehicle-related accidents in the United States reported to have been 2,400 for ambulances in 1990,²⁶ it is medically unsound and managerially unsafe to require lights-and-siren response on all incidents.²⁷⁻²⁹

Response classifications will vary from one EMS system to another based on the type of system resources, response limitations, traffic patterns, and geography of their service areas. Response configurations often become more complex for larger or more sophisticated systems.²³⁻²⁵ It must be stressed that decisions regarding response assignments are a responsibility of medical management and should be subject to the approval of the medical director of an EMS system.^{6,11,12}

Ideally, standardized response classifications should be based on a uniform coding system. This would assist in consistency of use, statistical comparison,

and scientific research across EMS systems that use the same medical dispatch protocols.⁹

The non-English-speaking caller poses an ever-increasing challenge for many dispatch centers, especially those in large urban centers. This issue has three basic solutions: 1) sufficient staffing of EMD's with multilingual capability where a center's constituency has demonstrated frequent use of a particular language or languages other than English; 2) secure access to a language-interpreting service such as that provided by one of the major long distance carriers; and 3) provision of medical dispatch protocols in commonly encountered languages. At the time of publication of this paper, alternate language versions of protocols used in the United States are available in Spanish, French, and German.

It is recommended that emergency medical dispatch protocols:

- Be medically approved
- Be uniform throughout each EMS jurisdiction
- Use standard response classification codes to facilitate scientific comparison and study among systems using the same protocols
- Be followed consistently and nonarbitrarily by all EMD's, except when additional clarification is needed
- Delineate the types of cases requiring an ALS versus a BLS response (especially in tiered systems) and the types of cases requiring use of lights and siren from those that do not.

Dispatch Life Support

Dispatch life support encompasses the knowledge, procedures, and skills used by trained EMD's to provide care through prearrival instructions to callers. It consists of those BLS and ALS principles that are appropriate for application by EMD's. Dispatch life support forms the basis for establishing the content and application methodology for prearrival instructions used by medical dispatchers.³⁰ The NAEMSP¹⁷ has also defined dispatch life support (see the definitions that follow).

Prearrival instructions differ from the less well-specified telephone aid, and the differences between them form the basis of recommendations for standardization of EMD training and practice (including dispatch life support):

Prearrival Instructions. Prearrival instructions are medically approved, written instructions given by trained EMD's to callers that help provide necessary assistance to the victim and control of the situation prior to the arrival of EMS personnel. Prearrival instructions are read word for word by the EMD to the fullest extent possible.

The necessity to routinely provide prearrival instructions has been addressed by the NAEMSP: "Pre-arrival instructions are a mandatory function of each EMD in a medical dispatch center. . . .Standard medically approved telephone instructions by trained EMD's are safe to give and in many instances are a moral necessity."¹⁷ The failure to provide prearrival instructions, when possible and appropriate, is currently being litigated in the Nation's courts as a form of dispatcher negligence. It is interesting to note that one of the most significant obstacles to the establishment of prearrival instructions, and medical dispatch protocol systems in general, has been the notion that agencies can be

successfully sued for engaging in such activities. It appears that there has never been a dispatcher negligence lawsuit filed for the provision of medically sound prearrival instructions. There are a significant number of lawsuits recently completed or in progress for which the omission of prearrival instructions (or “dispatcher abandonment,” as the legal terminology describes it) has been alleged.

The nature of prearrival instructions is such that they must be provided in a timely manner, over the telephone, and without the benefit of practice or visual verifications. Thus, it is important that EMD’s carefully adhere to protocols for the provision of telephone-instructed treatment in a standard, nonarbitrary, and reproducible way.

Box 1. Application of Emergency Medical Dispatching Principles to the Patient With Suspected AMI and Cardiac Arrest

Emergency medical dispatching principles, as operationalized in medical dispatch protocols and prearrival instructions, can be readily applied to the potential AMI and cardiac arrest patient. For all patients, key questions are asked as to whether the patient is reported to be unconscious and not breathing to ascertain if a cardiac arrest has occurred. For example, the answer “I’m not sure” regarding breathing status given by a second-party caller (someone who can see or easily access the patient) is assumed to mean “no”; therefore, a maximal response, preferably ALS/paramedics, would be sent immediately. The key questions, then, also determine the most appropriate level of response. If a cardiac arrest has been verified, first responders can be given the chief complaint, approximate age, the status of consciousness and breathing, and the dispatch response code, facilitating preparation for possible use of an automated external defibrillator. Prearrival instructions in the case of a cardiac arrest would entail dispatcher-assisted CPR.

For a patient with chest pain, additional dispatcher interactions with the caller are recommended to overcome caller or patient denial or to validate that the caller’s descriptions of symptoms and signs may represent the presentation of a heart attack. Specifically, the dispatcher may ask the caller if the patient has severe indigestion; tightness; heavy pressure; constricting band and crushing discomfort in the chest with the spread of these feelings to the arms, jaw, neck, or back; as well as the presence of nausea or sweating. Verification of these symptoms directs the dispatcher to advise the responders so that their functions at the scene can be expedited. Prearrival instructions in these cases would include correct positioning of the patient, instructions for vomiting, and instructions to monitor very closely and to call back if the patient’s condition worsens.

Telephone Aid.

Telephone aid, as defined herein, consists of “ad libbed” instructions provided by either trained or untrained EMD’s. Telephone aid differs from dispatch life support in that the instructions provided to the caller are based on the dispatcher’s previous training in a procedure or treatment but are provided without following a scripted prearrival instruction protocol. This method exists because either no protocols are used in the medical dispatch center or protocol adherence is not required by policy and procedure (e.g., the dispatcher is “trained” in CPR and thus describes to the caller, to the best of his or her verbal ability, how to do CPR).

As noted in the section (above) on prearrival instructions, dispatchers must carefully adhere to written protocols.

Unfortunately, coupled with a growing interest and effort within public safety agencies to provide some type of telephone instructions to callers, many agencies are “allowing” dispatchers to ad lib instructions. There appears to be a significant difference between dispatch life support-based prearrival instructions and telephone aid. Telephone aid, as defined, may only ensure that the dispatcher has attempted to provide some sort of care to the patient through the caller but does not ensure that such care is correct, standard, and medically effective or even necessary in the first place.

Telephone aid often causes the following predictable errors:

1. Failure to correctly identify conditions requiring telephone intervention and therefore prearrival instructions in the first place (e.g., “saving” an infant having a febrile seizure who was incorrectly identified as needing CPR due to failure to follow protocols that are medically designed to verify need—verify breathing, pulse, etc., before potentially dangerous dispatcher-invasive treatments such as compressions are initiated).
2. Failure to accurately identify the presence of interim symptoms and signs (or the lack of them) during the in-progress provision of telephone intervention (e.g., dispatchers who ad lib CPR sequences often miss important patient verifiers that cannot be seen by the dispatcher, such as watching for the chest to rise).
3. Failure to perform (describe or teach) multistep procedures, such as CPR care, in a consistent and reproducible fashion regardless of which dispatcher in a center provides such help (e.g., quality assurance review of these types of cases often reveals that dispatchers in the same center [or even the same dispatcher] perform care differently each time if they are not following scripted prearrival instruction protocols closely).

Telephone aid, as defined, often provides only the illusion of correct help via telephone without predictably ensuring consistent and accurate instructions to all callers. Telephone aid, therefore, is usually considered an inappropriate and unreliable form of dispatcher-provided medical care.

Medical dispatch practice must be safe, competent, and effective. The systematic use of medically preapproved protocols will help to ensure that the dispatcher performance is structured and reproducible and can be objectively measured.

In light of the important differences between prearrival instructions and telephone aid, and to improve standardization of EMD training and practice, it is recommended that:

- Dispatch life support be adopted nationwide as an essential concept of emergency medical dispatch
- Dispatch life support be standardized
- Prearrival instructions be provided from written protocol scripts for all medical emergencies.

Medical Dispatcher Training

Formal EMD training contributes to the safe and effective performance of the medical dispatcher’s role in EMS.¹¹

Guidelines for the core content of EMD courses are currently being standardized by the ASTM.¹⁹ These guidelines will provide direction for the training (and certification) of EMD’s regarding appropriate decisions about EMS responses in a safe, consistent, and nonarbitrary manner. Within the context of this broad goal, current EMD training is generally at least 24 hours in length (e.g., three 8-hour days). A typical course consists of an overview of dispatching objectives and basic dispatch techniques, concentrating on known problem areas.

The role of the EMD is defined, and the concepts of medical dispatching are discussed in detail. The medical dispatch protocol in use by the sponsoring EMS agency is learned, with emphasis on interrogation skills, protocol compliance, and the provision of prearrival instructions. Common medical problems are reviewed, with an emphasis on interrogation specifics for each type of problem, and the relevance and relationship of listed prearrival instructions. Throughout the training, the importance of identifying the presence or absence of symptoms (such as “chest pain”) during interrogation is emphasized, rather than making a judgmental diagnosis of “heart attack.” The medical significance of the various levels of urgency for each chief complaint and its resultant response is clarified to give the student the ability to prioritize quickly the various types of incidents confronting EMD’s daily. Often, courses use mock case drills to give the dispatcher a hands-on feel of protocol performance.

A formal examination to test student understanding and assimilation of the curriculum should be administered at the completion of an EMD course. This enables formal certification in jurisdictions requiring or allowing it.^{6,17,31}

It is recommended that EMD training:

- Be required of all medical dispatchers
- Be consistent in core curriculum content nationally
- Be based on the medical dispatch protocol selected and approved by the sponsoring agency’s physician medical director, allowing for practice use of the protocol by the EMD trainee.

Medical Dispatcher Certification

Given the very important role of the dispatcher in the chain of survival, certification should become governmentally mandated throughout the United States.^{6,17,31}

Certification should include requirements for continuing education and recertification. Continuing education programs should incorporate formal written and practical tests. Continuing education and recertification allow EMS agencies to formally promote and ensure the ongoing quality of EMD performance. Certification also establishes processes for decertifying individuals who cannot meet minimum standards. There have been no studies to determine the optimal frequency or process of recertification; therefore, expert panels have recommended that EMD’s should be recertified every 2 to 4 years.⁶ At least 12 hours per year of continuing education should be required for EMD recertification.^{20,31}

It is recommended that EMD certification:

- Be required of all EMD’s through either State government processes or professional medical dispatch standard-setting organizations
- Require continuing education and recertification as components of a continuing certification process.

Medical Dispatch Quality Control and Improvement

Each EMS system should have in place a comprehensive quality improvement program. Four goals in the quality control and improvement of medical dispatch activities are that:

1. Dispatchers understand medical dispatch policy, protocol, and practice
2. Dispatchers comply with medical dispatch policy, protocol, and practice
3. Deficiencies in understanding and compliance with medical dispatch policy, protocol, and practice among dispatchers be corrected
4. Medical dispatch policy, protocols, and practice be updated on a continuous basis to ensure that they are appropriate and effective.

A comprehensive quality control and improvement system for emergency medical dispatching has several components. Among these are selection of personnel; orientation; initial training; certification and recertification; continuing dispatch education; physician medical direction; data generation; case review and performance evaluation; correction of performance problems (risk management); and decertification, suspension, or termination.³² These components of medical dispatcher quality improvement are essential for maintaining the type of employment environment necessary to ensure safe and effective patient evaluation and care.

One of the most important areas of quality control/improvement is that of case review and performance evaluation.³² Between 7 and 10 percent of each EMD's cases should be randomly reviewed.²⁰ The review of random cases ensures that each dispatcher's current practice (especially compliance with protocol) is determined.³³ In addition, the review of out-of-the-ordinary cases (both excellent and problematic) is important. These cases are often identified by sources external to the dispatch center. The involvement of EMS field personnel in reporting incidents that appear to represent dispatch-related problems can be very helpful in strengthening the performance and policy evaluation process.

These case reviews should serve as the basis for periodic dispatcher performance evaluation. The cumulative level of compliance to protocol of each medical dispatcher should be evaluated and compared with preset levels of acceptable practice. This provides an objective method of establishing thresholds of performance for these essential members of the EMS team. Corrective steps may include continuing education or disciplinary action.

In the absence of adequate case review and performance evaluation, it has been shown that dispatcher compliance to protocol deteriorates and is generally under 50 percent.³⁴

Medical direction is an essential element in the overall assurance of quality performance of EMD's. Just as medical direction is uniformly recommended for emergency medical technicians and paramedics, the EMD requires careful attention and guidance. According to the NAEMSP, "The medical aspects of emergency medical dispatching and communications are an integral part of the responsibilities of the Medical Director of an EMS system. . . .Quality Improvement, Risk Management, and Medical Control and Direction are essential elements to the management of medical dispatch operations within the EMS system."¹⁷

It is recommended that ongoing medical dispatch quality control and improvement processes:

- Be in place for all medical dispatch centers
- Allow for random review of cases
- Require high-level compliance to protocol as a major factor in dispatcher performance evaluation
- Be the basis of dispatcher reeducation, feedback, discipline, and medical management
- Be carried out under the medical direction of a qualified physician.

The EMD is a key member of the EMS team. EMD's may have a profound effect on the early care of potential heart attack victims. To ensure optimal emergency

medical dispatching, this paper has made a number of recommendations, which are highlighted below:

- Each EMS system should utilize a set of written, medically approved dispatching protocols for the evaluation of, response to, and provision of care to the AMI patient. These protocols should be followed consistently and nonarbitrarily by all EMD's.
- Dispatch life support should be provided by each EMS system. EMD's should be required to use medically approved, written prearrival instructions to help callers provide aid to the AMI patient and control the situation prior to the arrival of EMS personnel.
- Every EMD should be formally trained, based on a nationally consistent core curriculum, with an emphasis on mastery of the dispatching protocol used by the sponsoring EMS agency.
- Certification should be required of all EMD's, either through State governments or professional medical dispatch standard-setting organizations. This process should also mandate continuing education and recertification.
- Every EMS system should have in place a system of continuous quality improvement for medical dispatching. This should include a random review of each EMD's cases. Periodic performance evaluations should be conducted with each EMD, with emphasis on the EMD's adherence to dispatching protocol.
- All aspects of emergency medical dispatching should be the ultimate responsibility of the EMS physician who provides medical direction for a given EMS system. That is, an EMS physician should be in an authoritative position to manage the medical care components of an EMD program, including overseeing training, selecting and approving dispatch protocols and prearrival instructions, and evaluating the EMD system.

These recommendations, if implemented, may result in improvement of emergency medical dispatching in general—and potentially better identification and treatment of patients with symptoms and signs of AMI, in particular.

1. Cummins RO, Ornato JP, Thies WH, Pepe PE. Improving survival from sudden cardiac arrest: the "chain of survival" concept. A statement for health professionals from the Advanced Cardiac Life Support Subcommittee and the Emergency Cardiac Care Committee, American Heart Association. *Circulation* 1991;83(5):1832-47.
2. American Heart Association, Emergency Cardiac Care Committee and Subcommittees. Guidelines for cardiopulmonary resuscitation and emergency cardiac care, II: adult basic life support. *JAMA* 1992;268(16):2184-98.
3. Becker LB, Pepe PE. Ensuring the effectiveness of community-wide emergency cardiac care. *Ann Emerg Med* 1993;22(2):354-64.
4. Roberts BG. EMS dispatching: its use and misuse. Dallas Fire Department internal report, 1978.
5. Cocks RA, Glucksman E. What does London need from its ambulance service? *Br Med J* 1993;306:1428-9.
6. American Society for Testing and Materials (ASTM). F 1258-90, Standard practice for emergency medical dispatch. In: Annual book of ASTM standards. Vol. 13.01, Medical Devices. Philadelphia: ASTM; 1991.
7. Clawson JJ. The hysteria threshold: gaining control of the emergency caller. *J Emerg Med Serv* 1986;11(8):40.
8. Eisenberg MS, Carter W, Hallstrom A, Cummins R, Litwin P, Hearne T. Identification of cardiac arrest by emergency dispatchers. *Am J Emerg Med* 1986;4(4):299-301.
9. Clawson JJ. Medical priority dispatch—it works. *J Emerg Med Serv* 1983;8(2):29-33.
10. Carter WB, Eisenberg MS, Hallstrom AP, Schaeffer S. Development and implementation of emergency CPR instruction via telephone. *Ann Emerg Med* 1984;13(Pt 1):695-700.
11. Clawson JJ. Dispatch priority training: strengthening the weak link. *J Emerg Med Serv* 1981;6(2):32-6.
12. Clawson JJ. Telephone treatment protocols: reach out and help someone. *J Emerg Med Serv* 1986;11(6):43-6.
13. Clawson JJ, Dernocoeur KB. Principles of emergency medical dispatch. Englewood Cliffs (NJ): Brady/Prentice Hall; 1988. 352 p.
14. Culley LL, Clark JJ, Eisenberg MS, Larsen MP. Dispatcher-assisted telephone CPR: common delays and time standards for delivery. *Ann Emerg Med* 1991;20(4):362-6.
15. Valenzuela T, Spaite D, Clark D, Meislin H, Sayre R. Estimated cost-effectiveness of dispatcher CPR instruction via telephone to bystanders during out-of-hospital ventricular fibrillation. *Prehospital Disaster Med* 1992;7(3):229-34.
16. Kellermann AL, Hackman BB, Somer G. Dispatcher-assisted cardiopulmonary resuscitation. Validation of efficacy. *Circulation* 1989;80:1231-9.

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17. National Association of Emergency Medical Services Physicians. Emergency medical dispatching [position paper]. *Prehospital Disaster Med* 1989;4(2):163-6.
 18. Clawson JJ. Emergency medical dispatching. In: Roush WR, editor. *Principles of EMS systems: a comprehensive text for physicians*. Dallas: American College of Emergency Physicians; 1989;119-33.
 19. American Society for Testing and Materials (ASTM). F-1552, Standard practice for training, instructor qualification and certification eligibility of emergency medical dispatchers. September 1994.
 20. American Society for Testing and Materials (ASTM). F-1560, Standard practice for emergency medical dispatch management. September 1994.
 21. Adams R. Lessons learned from Dallas. *Firehouse* 1984; May:12-4.
 22. Clawson JJ. Priority dispatching after Dallas: another viewpoint. *J Emerg Med Serv* 1984;9(5):36-7.
 23. Curka PA, Pepe PE, Ginger VF, Sherrard RC. Computer-aided EMS priority dispatch: ability of a computerized triage system to safely spare paramedics from responses not requiring advanced life support [abstract]. *Ann Emerg Med* 1991;20(4):446.
 24. Kallsen G, Nabors MD. The use of priority medical dispatch to distinguish between high- and low-risk patients [abstract]. *Ann Emerg Med* 1990;19(4):458-9.
 25. Stratton SJ. Triage by emergency medical dispatchers. *Prehospital Disaster Med* 1992;7(3):263-9.
 26. National Safety Council. *Accident facts*. 1992 edition. p. 78,79.
 27. Auerbach PS, Morris JA Jr, Phillips JB Jr, Redlinger SR, Vaughn WK. An analysis of ambulance accidents in Tennessee. *JAMA* 1987;258:1487-90.
 28. Clawson JJ. The red-light-and-siren response. *J Emerg Med Serv* 1981;6(2):34-5.
 29. Kupas DF, Julia DJ, Pino BJ. Patient outcome using medical protocol to limit "red lights and siren" transport [abstract]. *J Emerg Med Serv/Prehospital Care Forum* 1993;18(3 Suppl):S-9.
 30. Clawson JJ, Hauert SA. Dispatch life support: establishing standards that work. *J Emerg Med Serv* 1990;15(7):82-8.
 31. Clawson JJ. Regulations and standards for emergency medical dispatchers: a model for state or region. *Emerg Med Serv* 1984;13(4):25-9.
 32. Clawson JJ. Quality assurance: a priority for medical dispatch. *Emerg Med Serv* 1989;18(7):53-62.
 33. Clawson JJ. Medical dispatch review: "run" review for the EMD. *J Emerg Med Serv* 1986;11(10):40-2.
 34. Clawson JJ. Six month status report with evaluations and recommendations for the comprehensive medical priority dispatch system of the Los Angeles City Fire Department. Salt Lake City: Medical Priority Consultants, Inc; December 27, 1990. 21 p.

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